REMOVAL ACTION REPORT

FOR

FANSTEEL LABPACK
10 TANTALUM
MUSKOGEE, MUSKOGEE COUNTY, OKLAHOMA

Prepared for

U.S. Environmental Protection Agency Region 6
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EXECUTIVE SUMMARY

The U.S. Environmental Protection Agency (EPA) Emergency Management Branch (EMB) tasked Weston Solutions, Inc., the EPA Region 6 Superfund Technical Assessment Response Team (START) contractor, to provide technical assistance and documentation of time-critical removal action activities conducted by the Emergency and Rapid Response Services (ERRS) contractor at the Fansteel Metals (Site), located in Muskogee, Muskogee County, Oklahoma. Fansteel Metals operated under the U.S. Nuclear Regulatory Commission (NRC) license No. SMB-911.

During an initial site assessment conducted at the Site in June 2018, EPA identified a large quantity of various laboratory grade chemicals within the former laboratory area of the Site. The assessment involved initial photo documentation, observations recorded in the site logbook of the materials encountered in the laboratory area, and preliminary screening for radiological hazards including air sampling and fixed and removable radiological contamination surveys.

From 17 July through 21 July 2018, START provided technical support including air monitoring, radiological air sampling, fixed and removable radiological contamination surveys during the time-critical removal action conducted at the Site, and oversight of container over-packing and segregation, while ERRS conducted disposal of miscellaneous laboratory contents and drained a 10,000-gallon aboveground storage tank (AST) containing Ammonium Hydroxide. Activities completed are summarized as follows:

- A total of 1,518 containers were removed from the laboratory area and transported to disposal and recycle facilities.
- A total of 1,100 gallons of Ammonium Hydroxide was recovered from the 10,000 gallon Ammonium Hydroxide tank. The recovered liquid was sent to a recycler for disposal/recycling.
- All containers removed from the site were surveyed for fixed and removable radiological contamination to insure none of the NRC license condition release limits for the site were exceeded. No exceedance were encountered due to the site materials.
- Air monitoring was conducted utilizing a MultiRAE Pro multi-gas monitor upon entry to the main building for carbon monoxide (CO), hydrogen sulfide (H_2S), volatile organic compounds (VOCs,) lower explosive limit (LEL), and oxygen (O_2). There were no detections above background during monitoring activities.

- Air sampling for radionuclides was performed to insure limits did not exceed Derived Air Concentrations (DAC). Air sampling results showed no exceedances of the DAC during the project.

START prepared this Removal Action Report to describe the technical scope of work that was completed as part of TDD No. 0001/18-125 under Contract No. EP-S5-17-02 for EPA Region 6.

[ ] The EPA Task Monitor did not provide final approval of this report prior to the completion date of the work assignment. Therefore, Weston Solutions, Inc. has submitted this report absent the Task Monitor's approval.

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LIST OF FIGURES

Figures are provided as separate PDF files.

1. INTRODUCTION

Weston Solutions, Inc. (WESTON®), the U.S. Environmental Protection Agency (EPA) Region 6 Superfund Technical Assessment and Response Team (START) contractor, was tasked by the EPA Region 6 Emergency Management Branch (EMB) under Contract Number EP-S5-17-02 and Technical Direction Document (TDD) No. 0001/18-125 (Appendix I) to provide technical assistance and documentation of Emergency and Rapid Response Services (ERRS) contractor during a time-critical removal action at the Fansteel Metals Site (Site) located at 10 Tantalum, Muskogee, Muskogee County, Oklahoma. A Site Location Map and Site Area Map are provided as Figures 1-1 and 1-2, respectively. The Superfund Enterprise Management System (SEMS) Identification (ID) number for the site is OKD007221831. START has prepared this report to describe the technical scope of work that was performed during the time-critical removal action at the Site.

1.1 PROJECT OBJECTIVES

The project objectives of the emergency removal action were to:

- Inventory and remove for disposal various containers located in the on-site laboratory.
- Remove and dispose of the approximate 3,000 gallons of Ammonium Hydroxide stored in a 10,000-gallon aboveground storage tank (AST), located on the eastern side of the main building.

The laboratory materials were laboratory packed into drums and smaller containers for disposal by ERRS personnel. In addition to removing the laboratory items, START conducted a radiological contamination survey to document that no material left in the laboratory exceeded the release limits in FMRI (Fansteel) Source materials license SMB-911, Condition 33.

The project objectives were met by providing oversight support, air monitoring/sampling, contamination surveys, and container inventory management during the over-packing of various laboratory and waste containers followed by loading and transportation to a disposal facility by ERRS.

1.2 SCOPE OF WORK

START removal action activities included conducting preliminary air monitoring, air sampling, and radiological contamination surveys; categorizing containers and managing disposal data; and maintaining site documentation using the site logbook, digital photographs, and EPA Response Manager. In preparation for the removal action, a site-specific health and safety plan (HASP) was prepared, and the necessary air monitoring and expendable equipment was procured to complete the field assignment. At the completion of the field assignment, START prepared a Final Removal Action Report documenting the time-critical removal activities completed.

1.3 REPORT FORMAT

This Removal Action Report has been organized as follows:

- Section 1 - Introduction
- Section 2 - Background
- Section 3 - Actions Taken
- Section 4 - Summary

Figures referred to in this document are presented as separate portable document format (PDF) files. A Site Location Map and Site Area Map are provided as Figures 1-1 and 1-2.

2. BACKGROUND

Information regarding the site location and description, site history, and site concerns is included in the following subsections.

2.1 SITE LOCATION AND DESCRIPTION

The Site is located at 10 Tantalum, Muskogee, Muskogee County, Oklahoma. The Site is located on the eastern side of the City of Muskogee and is bordered by the Arkansas river to the east and an industrial park to the north, west, and south. A Site Layout Map is provided as Figure 2-1.

The 110-acre property is currently fenced along the perimeter of the property, although the main entrance is not guarded. The Site is comprised of an administrative building, several building that housed various operation units, a groundwater treatment unit, water treatment ponds, closed out ponds or "basins," a waste impoundment, and other smaller buildings. Geographic coordinates of the administrative building containing the laboratory, Latitude 35.77462° North and Longitude 95.302937° West, were obtained using a handheld Global Positioning System (GPS) based on the World Geodetic System – 1984 (WGS-84) datum.

Other significant site features include a 10,000-gallon Ammonium Hydroxide AST. There are managed piles of waste and strata found in closed ponds. Some of the waste has been containerized in SuperSacks or MegaBags and is awaiting future recovery and off-site disposal. There is also waste in active water treatment ponds. Those ponds are part of the groundwater treatment operation that captures potentially contaminated water prior to entering the Arkansas River.

FMRI is leasing one of their buildings adjacent to the main entrance to a powder coating company. Figure 2-2, the Site Layout Map, depicts the locations of historical and current site features.

For the purposes of the time-critical removal action, the two areas addressed included the laboratory area of the main building and the 10,000-gallon AST with a reported 3,000-gallons of Ammonium Hydroxide liquid.

2.2 SITE HISTORY

The Site is a former metals processing plant that extracted Tantalum and Columbium (aka niobium) from ores and slag. Fansteel operated the plant from 1956 to 1990. Since 1990, the activity at the Site has been limited to environmental monitoring, maintenance, and some cleanup of operation areas. The ore and slag contained trace amounts of uranium and thorium, about 0.15% of the raw material. The amount of radioactive uranium and thorium was enough to be considered as "source material" by the NRC. Fansteel Metals operated under an NRC license that has been modified when the facility stopped production (NRC license No. SMB-011).

3. ACTIONS TAKEN

On June 5, 2018, EPA, START, and ERRS mobilized to Muskogee, Muskogee County, Oklahoma, to begin preparing the site for the time-critical removal action. While on-site, START provided written and photographic documentation and conducted preliminary air monitoring, air sampling, and radiological contamination surveys. A Pollution Report (POLREP) is presented in Appendix A. Digital photographs taken by START are presented in Appendix B. The site logbook is included in Appendix C. A consent for access to the Site is in included in Appendix D.

On 5 June and 6 June 2018, preliminary air monitoring was conducted utilizing a MultiRAE Pro multi-gas monitor around the breathing area of the lab areas entry for carbon monoxide (CO), hydrogen sulfide (H_2S), volatile organic compounds (VOCs), lower explosive limit (LEL), and oxygen (O_2). There were no detections of contaminants that exceeded background levels during air monitoring activities. Numerous bottles labeled as Hydrogen Fluoride (HF) were encountered in the laboratory area and tested positive as an acid solution, so they are presumed to be correctly identified.

From 5 June through 8 June 2018, START established a control area to check personnel boots and/or equipment exiting the facility and utilized a box truck as a temporary counting area. START performed response checks of all radiological equipment and insured that all equipment was operational and within the calibration due date. EPA and START personnel performed an initial assessment of all the containers within the laboratory area. START personnel collected exposure rate measurements in the laboratory area, and the measurements did not exceed 15 microRoentgens per hour (µR/hr). START also collected stationary measurements with a Ludlum 43-93 meter and collected swipes samples to see if any radioactive material was removable from the containers encountered. Appendix E includes the swipe samples results for the initial fixed scanning measurements and the removable radioactive materials measurements collected during the initial assessment. Most containers did not appear to have radioactive materials; however, some containers that contained waste-in-process (WIP) material and pond materials were elevated for either fixed and/or removable radioactive materials measurements. WIP and pond sample material were not included in the labpack since they are process related and not laboratory-related materials. Air samples for radionuclides were collected on 47-millimeter (mm) glass fiber filters

while personnel worked in the lab area. Gross Alpha and Beta Counts showed that there was a potential to exceed the DAC for the work area in the laboratory building. The laboratory samples were submitted to the EPA National Analytical Radiation Environmental Laboratory (NAREL) for isotope analysis.

On 8 June 2018, EPA and START completed the initial assessment of the lab area and demobilized from the Site.

On 16 July 2018, EPA, START, and ERRS returned to the Site to perform laboratory packing and removal of Ammonium Hydroxide in the AST.

On 17 July through 21 July 2018, ERRS began removal activities. ERRS began segregating containers into the separate waste streams. Appendix F is the laboratory inventory count that contains the container list for each hazard classification and the contents classified by ERRS. ERRS containerized a total of 1,518 containers and drained approximately 1,100 gallons of Ammonium Hydroxide from the 10,000-gallon AST. START performed exposure rate measurements, fixed contamination and removable contamination surveys for container release. Release criteria was based on the Site (listed as FMRI in the NRC license) source materials license SMB-911, Condition 33: Fixed Alpha direct measurements of 1,000 disintegration per minute (dpm)/100 square centimeters (cm2); Fixed Beta direct measurements of 5,000 dpm/100 cm2; removable Alpha measurements of 200 dpm/100 cm2; and removable Beta/Gamma measurements of 1,000 dpm/cm2. Fixed measurements were collected with a Ludlum 2360 meter paired with a 43-93 Alpha/Beta probe with an active detector window of 100 cm2. Removable measurements were collected on swipe samples taken from 100 cm2 and counted with the EPA-owned Ludlum 3030 Alpha/Beta counter. Results for the swipe samples are include as Appendix G Clearance Survey Forms. Efficiencies for both equipment setups were determined from on-site Alpha and Beta sources. Minimum Detectable Activity (MDA) were calculated for the Gross Alpha and Beta counter and the Ludlum 43-93 probes to insure that release limits were met. Air volume requirements were determined from Derived Air Concentrations (DAC) for Thorium 232 and the MDA for the counting. START performed daily response checks of all radiological equipment and insured that all equipment was operational and within the calibration due date.

On 6 August through 7 August 2018, EPA, ERRS, and START remobilized to the site for the labpack material and totes of Ammonium Hydroxide to be transported to their respective disposal and recycle facility. Totes and pallet of containers were previously stored in a clean area for removal from the site so that rescanning of items was not necessary. A copy of manifests are provided as Appendix H. ERRS completed loading of a total of 1,518 containers and approximately 1,100 gallons of Ammonium Hydroxide that was removed from the site.

On 8 August 2018, EPA, ERRS, and START demobilized from the site.

4. SUMMARY

START performed an initial site assessment from on 6 June through 8 June 2018 to assess radiological hazards at the site and the initial laboratory container radiological surveys. START performed oversight and technical support to EPA Region 6 during the time-critical removal action conducted at the Site from 16 July through 21 July 2018. START conducted air monitoring/sampling for chemicals of concern and radionuclides, fixed and removable radiological contamination surveys during ERRS operations. ERRS categorized chemicals for disposal and drained the Ammonium Hydroxide tank. All START air monitoring/sampling and removal activities were performed in accordance with the site-specific HASP, NRC release criteria, and TDD requirements. Activities completed are summarized as follows:

- A total of 1,518 containers were removed from the laboratory area and transported to disposal and recycle facilities.
- A total of 1,100 gallons of Ammonium Hydroxide was recovered from the 10,000-gallon Ammonium Hydroxide tank. The recovered liquid was sent to a recycler for disposal/recycling.
- All containers removed from the site were surveyed for fixed and removable radiological contamination to insure none of the NRC license condition release limits for the site were exceeded. No exceedance were encountered due to the site materials.
- Air monitoring was conducted utilizing a MultiRAE Pro multi-gas monitor upon entry to the former Canning Building for carbon monoxide (CO), hydrogen sulfide (H_2S), volatile organic compounds (VOCs,) lower explosive limit (LEL), and oxygen (O_2). There were no detections above background during monitoring activities.
- Air sampling for radionuclides was performed to insure limits did not exceed DAC. Air sampling results showed no exceedances of the DAC during the project.